ENGELMANN (GEO. J.)

TREATMENT

OF

POST-PARTUM HEMORRHAGE.

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BY

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CONTENTS.

I. Introduction 4

II. Frequency 4

III. Causes 5

IV. Diagnosis 6

1. Of existing hemorrhage 6
2. Of threatened hemorrhage 7

V. Treatment 7

A. Preventive Treatment 7

1. In ordinary labor 8
2. If Post-Partum Hemorrhage is expected 9

a. Treatment during pregnancy 9
b. Treatment during labor 9
Rupture of membranes 9
Use of ergot 9
Management of the placenta 9

B. Curative Treatment 10

1. My own treatment, with case histories 10

Manual pressure 11
The use of ergot 11
Introduction of the hand 11
Introduction of ice into the cavity 11
Injection of hot or cold water 11
The iron swab 12

2. The various remedies generally resorted to 16

Older methods 16

a. Internal 16

Ergot 16
Acetate of lead 16
Cannabis indica 16

b. External, mechanical and chemical 16

Mechanical means 16
The binder 16
Bimanual compression 16
Compression of aorta 17
Plugging vagina 17
Condon or rubber bag 17
Use of hand as curette 17

Chemical means 18
The lemon 18
Alum water 18
The vinegar swab 18
The injection of perchloride of iron 18
Galvanism 19

3. Later methods 19
a. Nitrite of amyl 19
b. Subcutaneous injection of ether 19
c. The hot water douche 20

C. Treatment of syncope 24

D. After treatment 25

VI. Conclusions 25

I.—INTRODUCTION.

There are few questions in obstetrics which are so frequently discussed and with such unvarying interest as that of post-partum hemorrhage; but few of the accidents of parturition are so appalling in their nature, so trying to the accoucheur, so dangerous to the patient and so alarming to the mother and her surroundings, as the sudden gush of blood at the close of an apparently happily terminated labor. Under no other circumstances is the physician thrown so utterly upon his own resources; without time for consultation with a fellow practitioner, often without time even for a moment's deliberation, and without the possibility of sending for necessary remedies. But fortunately there is no other accident which is so fully under the control of any competent accoucheur, if he will but act with coolness, promptness and judgment; and it has been justly said, that unless the physician is prepared to act in such an emergency, he is not fitted to enter the lying-in chamber.

It is impossible for me, in a brief paper and with a comparatively limited experience, to discuss the subject of post-partum hemorrhage in full. I am no believer in theoretical papers, and will hence give but a mere outline of the subject, of the causes, diagnosis and treatment of post-partum hemorrhage. I shall limit myself in the main to hemorrhage, due to uterine inertia immediately after delivery, and to its treatment by the direct application of the persalts of iron to the bleeding surface. This method is equally safe and efficient, and will, I trust, serve to remove the serious objections existing in the minds of many against the use of this most potent and reliable agent.

The hot water douche equally demands our attention as being a new addition to our armamentarium and still untried by the profession at large.

II.—FREQUENCY.

With regard to the frequency with which post-partum hemorrhage occurs, I can only give an approximate idea, by reference to a short series of cases. Among the 100 patients delivered in the Maternity Hospital, of St. Louis, we had 4 cases of post-partum hemorrhage, 4 p. c., one being due to large intramural fibroids. Among 79 cases delivered at their homes, in the out-door department of the same institution, there were two cases,

in consecutive labors of the same patient, who suffered from this complication at every labor, constitutional predisposition, 2.5 p. c.

Among 875 patients delivered in the St. Louis Female Hospital, during the past 5 years, whilst under the regime of its present chief, Dr. P. V. Schenk, there were but 4 cases, 0.47 p. c.; in two of these the routine dose of ergot had not been given.

In 1250 cases, in the private practice of Dr. H. C. Rose, there were 21 cases of post-partum hemorrhage, 1.6 p. c. Transact. London Obstet. Soc. XVIII, p. 146.

Dr. Ewing Whittle, *Brit. Med. Journal*, Sept. 27, '73, p. 370, who has devoted so much attention to the symptoms which indicate coming hemorrhage, and who has given ergot whenever he found the short, sharp pain, claims to have had but one case of post-partum hemorrhage in 3750 labors, during a twenty years' practice.

Dr. W. I. Greene, Transact. London Obs. Soc., XIX, p. 77, cites 21 cases in 1500, or 1.4 p. c. This gives us a total of 52 cases in 3804, or 1.3 p. c., and only one death.

In my own private practice the cases seen have all been consultation cases, as yet.

In the five years from 1872–76, 3524 deaths are recorded in England, as due to flooding; the majority of these must have been caused by post-partum hemorrhage. Unfortunately the number of labors occurring during the same period of time is not stated, and no comparison can be established.

III.—CAUSES.

This accident is, as we have seen, comparatively frequent; we will all meet such cases, and in order that we may properly and promptly treat this much dreaded complication of labor, we must first recognize the underlying cause.

Thomas gives a very simple and practical classification, which it will be well for us to adopt. He says that post-partum hemorrhage is always due to one of three causes:

First, To failure on the part of the uterus to contract, when there is no mechanical interference. This is uterine atony or inertia, which is rarely primary. It may indeed be due to a hemorrhagic diathesis, a constitutional predisposition to flooding; or to a relaxation of the uterine fiber in consequence of long labor, wasting diseases, rapid or violent labor, rapid use of forceps,

over distension of the uterus by twins, or hydramnios, or the use of *alcoholic stimulants* during labor.

Upon this point I will briefly cite the remarks of Dr. T. W. Poole, in the *Canada Lancet*, of Dec. 1, 1879, who says, that in the early years of his practice he had a series of severe cases of hemorrhage, which he has since attributed to the then frequent custom of using whisky during labor; he has been more fortunate since avoiding the use of alcoholic stimulants; so also Kerr, in the *Brit. Med. Journal*, for August 24, 1878, seems to think that the hemorrhage in 64 cases, which he has attended, was mainly caused by alcoholic stimulants excessively given during labor. The too free use of chloroform should also be guarded against.

Second, Hemorrhage may be caused by the presence of some mechanical interference preventing the action of a uterus willing to contract. This may be a second child, the placenta retained wholly or in part, clots of blood, uterine fibroids, a distended bladder; peritoneal adhesions probably play a very unimportant part.

Third, By a laceration of the soft parts—the perineum or the vaginal walls, the cervix or the fundus uteri, and especially so if a morbid condition of the parts exists.

Many of these causes may be produced during a normal labor and in a healthy uterus by negligence or ignorance on the part of the practitioner, and above all uterine inertia, the main cause of post-partum hemorrhage, is but too often a secondary cause, following a badly managed labor, especially if in its third stage the uterus be not aroused to tonic contraction the very moment when the solid globe first seems to relax; the improper use of remedies, especially ergot, or stimulants, or the hastening of the earlier stages of labor by the impatient attendant, are equally fruitful sources of this trouble.

IV.—DIAGNOSIS.

The diagnosis of the existence of a hemorrhage is generally sufficiently simple; the flow of blood becomes evident, sometimes oozing away slowly, sometimes coming in gushes, and in addition to this, the general symptoms of hemorrhage appear, and the firm uterine tumor fades away, loosing its distinct outline; if this occur in the absence of external hemorrhage, the condition is most dangerous, as being deceptive and liable to mislead

the inexperienced or careless practitioner; a soft abdominal swelling, which is the uterus distended with blood, will then develope, often accompanied with great agony; if the obstruction at the os, the clot, by contraction or compression be then removed, we will at once have an external, instead of the deceptive, internal hemorrhage. Extreme cases of hemorrhage, external as well as internal, will be accompanied by the rapid, feeble pulse, pallor, restlessness, and all these well-known and much dreaded symptoms which precede syncope.

We should however look with equal anxiety for the symptoms which are frequently indicative of coming hemorrhage. Thus Whittle already showed in 1853, and again points out in the thorough article already mentioned, that hemorrhage never comes unless preceded by a peculiar character of the labor pains; these pains are strong and quick; they do not gradually culminate in a strong pain and then subside again, but they are sharp, quick, and cease suddenly; the intervals are long in proportion to the duration of the pains; about two or three minutes, if each pain last only from forty to fifty seconds, sharp, with intervals of from five to six minutes, though the labor may proceed steadily and the head advance a little with every pain, you will be sure to have hemorrhage after delivery, unless you succeed in altering the character of the pains, in making the pains longer and the intervals shorter. Relaxation follows sharp contraction; after the expulsion of the child a relaxation follows, one or two sharp pains expel the placenta, and the uterus again relaxes.

Various authors call attention to this character of the pains as indicative of hemorrhage, but none so earnestly as Whittle.

We are warned by almost every writer that danger threatens if the pulse remains quick, over 100, and perhaps full, instead of sinking after delivery, and that the patient should not be left nntil the pulse has fallen to, at least approximately, its normal beat. Bradley, *Brit. Obst. Jour.*, Aug. 18, p. 287. Labatt, McClintock, Gooch, Churchill, 5th Ed., p. 250.

V.—TREATMENT.

A.—PREVENTIVE TREATMENT.

Before we discuss the treatment of an existing hemorrhage, the curative treatment, we must dwell for a moment upon the

means in our power to prevent the occurrence of this dangerous accident.

1.—IN ORDINARY LABOR.

However superfluous the advice may seem, I should insist upon the observance of the usual precautions and the ordinary obstetric rules in *every* case of labor. The physician sees so many perfectly normal, to him tedious and uninteresting, labors, that he is liable to become somewhat negligent. There are several points, which should more especially claim our attention:

1. However desirous the patient and her physician may be of completing the labor, it should never be unduly hastened, either by ergot or bearing down and violent straining efforts.

2. The proper attention should be paid to the usually somewhat neglected third stage of labor, the placenta should not be too speedily removed, nor should the patient force it out, or the physician drag it down by the cord. The treatment of the placenta is of very great importance, and it should receive the same attention, whether we have reason to anticipate hemorrhage or no.

I have always been in the habit of delivering the after-birth by Crêdé's method, and I never hurry it away; the presence of this mass serves as a stimulus to the contracting efforts of the womb, while at the same time it gives the uterine muscle an opportunity to rally after the relaxation following the expulsion of the child. It would be by far more difficult to obtain perfect and permanent contraction if the womb were obliged to pass at once to that condition from the preceding state of utmost dilatation; the presence of the placenta, filling the cavity, permits it to rest at an intermediate stage and rally before making the final effort. I have dwelt upon this point as some authors urge the speedy removal of the placenta, if there be any reason to anticipate hemorrhage.

After expulsion of the child, I keep my hand upon the fundus, to see that the uterus is properly contracted, or knead it gently and assist the efforts of nature, when I feel the uterus contracting under my hand, by grasping the fundus and forcing out the placenta. I never allow the after-birth to remain in the uterus over one-half an hour after the delivery of the child.

3. This accomplished, the physician should not hasten away, but should remain until he is assured that permanent contraction has taken place.

2.—IF HEMORRHAGE IS EXPECTED.

In case that a hemorrhagic diathesis exists or that the history of previous labors should lead us to expect an accident of this kind, we should *anticipate* by carefully attending to the health of the patient in the last months preceding parturition. Iron and strychnine are tonics especially indicated in anæmic subjects, whilst the plethoric will benefit by salines.

During the labor itself, if warned by the previous history, the character of the labor, the short, quick contraction of the womb or the exhaustion of the patient, everything must be done to guard the natural powers from exhaustion and to further the tonic contraction at the close of the third stage.

Sustain the strength of the patient without indulging too freely in alcoholic stimulants; rupture the membranes, if the os is yielding, when it approaches full dilatation; give a full dose of ergot when the head begins to distend the perineum—apply the forceps if expulsion is retarded and extract slowly, whilst an assistant follows the fundus with his hand; keep your hand upon the uterus, treating the placenta by Crêdé's method until all danger of relaxation has passed away.

Ergot is an excellent preventive remedy, and although I do not deem it necessary to give it in ordinary cases, it is all important, if there be any indication that hemorrhage may be expected, if the short, sharp pains have been observed—if the uterus be very much distended—the labor either very rapid or tedious and exhausting; it has served well when given as routine practice, for instance in the St. Louis Female Hospital where but four post-partum hemorrhages occurred in 875 labors and in the practice of Dr. Whittle who had but one case in 3750 labors.

This valuable drug is too often injudiciously given; it produces tonic—not clonic—contractions of the uterine fibre, constant, not alternating with periods of relaxation; it should only be given toward the close of labor, especially when we wish to rectify the loss of contractility in an empty uterus.

I look upon *the binder* as a dangerous relic of the past harmless in ordinary cases, if loosely applied, anything but harmless if hemorrhage threatens, as it tends to conceal the dis-

tending uterus. Braxton Hicks decidedly opposes it; he says that it has "the great fault of concealing rather than of revealing or preventing hemorrhage," and Leishman is not very clear. He says that, although the bandage aids contraction, it is of no advantage at this period, rather the contrary, as it prevents us from watching the condition of the uterus and making use of the hand. "*It is best to have it loosely applied so as to admit of easy removal and reapplication, etc.*" If it is so loosely applied, I would ask, what support would it be to the uterus? And why add this unnecessary and at times injurious appliance? Is it merely to pander to the whims of those in attendance?

Although the preventive treatment is a most potent adjuvant to the failing powers of nature, there are cases when, even in the hands of the ablest men, it is of no avail. Such experience in cases of recurrent hemorrhage—hemorrhagic diathesis, where they were forewarned and vainly sought to protect the patient are related by Fordyce Barker, Transact. Am. Gynæcol. Society; Playfair *Brit. Obstetric Journal*, May, 1873, p. 89, and others.

B.—CURATIVE TREATMENT.

But what if this treatment fails us? or if—as more frequently happens—we are suddenly called to a case of flooding, the patient in a condition of collapse and life fast ebbing away; or a gush of blood surprises us, totally unprepared for the accident as we are congratulating ourselves upon the happy termination of the labor. I say unprepared; although almost criminal, it is true that the physician to whose hands the life of the patient is confided often goes unprepared for the emergencies which may arise—without his case—without ergot or iron or his catheter; these and a syringe, or at least a rubber tube, should always be on hand.

As I have already stated, I shall confine myself to immediate post-partum hemorrhage due to uterine inertia, and more especially to the treatment by the perchloride of iron.

1.—MY TREATMENT.

Find out the kind and character of the hemorrhage, and begin treatment with milder means, is a good rule to be governed by, provided you are prepared to act with decision at any moment.

If called suddenly to a case, familiarize yourself with it—the hand placed upon the fundus serves at once as a diagnostic and

a therapeutic agent; judicious pressure tends to empty the uterus of the accumulated clots, and kneading, as an irritant, stimulates contraction; at the same time we learn the amount of distension and relaxation of the organ as well as its contractility and the condition of the bladder, a point often neglected; if there be any accumulation of urine this should be evacuated at once, as a distended bladder mechanically hinders the contraction of the uterus, and may itself cause hemorrhage or resist our efforts at treatment, if existing from this or other causes.

I have rarely seen any effect from simple friction unless it be with ice, or by the hand dipped in cold water; it should be tried if there is but a slight bleeding, but if active interference is necessary, I endeavor to grasp and compress the distended fundus, at the same time directing the pressure downward in the axis of the pelvis; if the effect of cold be combined with that of pressure and mechanical irritation—i. e., the hand dipped in cold water—this gives us an effective means of dealing with milder cases; but if the blood still flows freely and the uterus will not contract, I keep one hand upon the fundus and pass the other into the vagina, clear out the clots and examine the condition of the parts. If the womb still does not respond I do not hesitate, but pass the hand at once into the uterine cavity, remove the clots, examine the inner surface and then with the knuckle of the clenched hand irritate the sluggish muscle, whilst firm pressure is maintained with the other hand, grasping the fundus, so that the flabby uterine walls are compressed between the two hands; if the uterus contracts well it will forcibly expel the troublesome hand; if not, I pass a piece of ice—which can be had in almost every house in the summer time—into the cavity—a handfull of snow will answer as well. I use this if it is to be had, without delay; if not, I have injected ice water, or cold water, whichever was convenient, into the uterus, keeping my hand in its place, so as to guide the nozzle of the syringe, which the assistant passed to me. Nothing is lost by this, if the womb does not contract, the cavity is thoroughly cleaned and ready for the use of iron.

I must say in this place, that although this has been my practice, I shall not continue it, since we have in hot water an equally powerful and much less disagreeable agent; the injection of a stream of cold water produces a severe shock and a local irritation stimulating contraction, but the bed-clothes are saturated,

wet and cold, and the patient herself, whose extremities are already cool, is chilled. Hot water will answer the purpose as well if not better and is not liable to the same objections.

If, after this, the womb does not contract I resort at once to the use of the iron, which I look upon as a powerful and safe styptic, but not as a dangerous and desperate *dernier resort*.

I bring the patient around in bed in position for the forceps, introduce a Cusco speculum and with wads of cotton prepared by an assistant, which I seize with my long uterine dressing forceps, I seek to clear the cavity of the blood which has again accumulated.

The assistant has also soaked a number of cotton wads, as large as a walnut, in perchloride of iron, and pressed out the mass of fluid, so as to leave them well soaked, but merely moist with iron; they must be well saturated but not dripping. As soon as I have cleaned the cavity as far as it is possible amid the constant flow of blood, I seize a wad of iron cotton on my forceps and mop the walls of the cavity thoroughly, removing as much as possible of the clotted blood as I withdraw the cotton. I rapidly take up one cotton wad after the other and swab the uterus until the hemorrhage ceases. We are generally given but little time; the iron acts as an irritant as well as styptic, and the uterus firmly and speedily contracts.

The perchloride of iron applied in this way has never failed me in any case where pressure, kneading, ice, ergot, cold water injections had all been tried in vain, or in cases which were so urgent as not to permit my resorting first to the questionable "ordinary treatment."

Leishman in discussing the intra-uterine injection of perchloride of iron considers it as justifiable and even called for in extreme cases, but says: "Were it possible to sponge the inner surface of the uterus in an efficient manner, this no doubt would be preferable, but as it would be all but impossible thus to bring the styptic solution into actual contact with the bleeding surface, some other means must be adopted."

It *is* possible to do this and to do it safely and effectually, at least I have no reason to suppose that others will be less fortunate than myself in following the treatment described.

Dr. Wynn Williams, as he tells in the noted discussions on the use of iron in post-partum hemorrhage in the London Obstetric Society, passes a sponge, upon which iron has been

poured, into the uterus, through the hollow of the hand already introduced, after emptying the uterus of clots, then sponges the interior of the womb. This I deem preferable to the injection of the styptic fluid, but not as safe as the application through the speculum.

The uterus has, in all cases, responded at once to this treatment and no ill effects either immediate or secondary followed. The getting up was as good as could be expected after a serious loss of blood, and I have never known febrile symptoms to follow.

Iron used in this way is certain to check hemorrhage, and is free from all the dangers which attend its use by injections; we avoid the immediate danger of forcing the fluid into the tubes and the secondary danger of septicæmia from disintegration of the clots *in utero*; there are no clots, nothing but the small black granules of coagulated blood, which gradually pass away with the lochial discharge.

This method is as safe as it is certain and must not be looked upon as a desperate last resort, but should be adopted in every case as soon as ordinary means fail, nor should we hesitate to employ it at once if the case seem alarming.

I have applied the iron in this way partially on account of the circumstances attending my first case, which pointed the way, and partially from the fact that I have often availed myself of gynæcological instruments in obstetric practice and agree fully with the opinion expressed by my friend Dr. Skene in his paper read before the Boston meeting of the American Gynæcological Society — "The Principles of Gynæcological Surgery Applied to Obstetric Operations."

I will cite a few cases of post-partum hemorrhage, in the very first one of which I adopted the treatment which I have since invariably followed:

CASES.

Case I.—This was an alarming case of post-partum hemorrhage which did not permit of loss of time in trying the ordinary methods, and the circumstances were such as necessarily to suggest the iron swab.

The patient, a somewhat anæmic multipara, thirty-two years of age, in whom a premature labor had been excited by a fall, was confined by a midwife; the child, which breathed but a few moments, was very small and the labor was an easy one; from what I could gather I should say that it was very precipitate

After everything had been properly attended to, the midwife left her patient comfortable and well. Fifteen minutes later she was flowing freely. The bed was soon drenched and the patient blanched. It was but a few squares from my office, and when sent for, being told of uterine hemorrhage, I did not stop for particulars, but gathering up my gynæcological case and iron hurried down. I found everything drenched with blood, the patient exsanguinated, almost pulseless, cyanosed lips, headache, dimness of vision, the soft uterine tumor high up in the abdominal cavity. Prompt and decisive action was called for. I did not stop to think of all that might be done, but removed the pillow, so as to place the head low, at once introduced my hand into the womb to clear away the clots, whilst with the other I manipulated the fundus. This seemed to excite a feeble contraction and temporarily lessen the bleeding, but I could not stay the hemorrhage, so having my instruments with me I determined to do what I had found so effectual in abortion, when hemorrhage continues after expulsion of the ovum. Whilst the husband gave her iced brandy, and applied ice to the fundus, I made a number of cotton balls, soaking some in ice water, (ice water because it happened to be on hand), some in iron. I then brought the patient partially around in bed, introduced a Cusco and cleansed the uterine cavity, swabbing it with wet cotton balls, which I rapidly followed with those steeped in iron, thoroughly swabbing the entire uterine cavity. The hemorrhage ceased, the womb speedily contracted, and the coagula formed I mostly removed with my cotton.

After the patient was again bedded I gave her one-sixth grain of morphine subcutaneously—no binder—and ordered small doses of sherry and beef tea at intervals. No return of hemorrhage; recovery slow but not marred by any unfavorable symptoms.

Case II.—Francis P., I para, æt. 22, in very fair health, was delivered of a well developed female child after a tedious labor. The placenta was found in the vagina and removed; the slight contraction of the womb which had existed soon ceased; the womb relaxed more and more; the hemorrhage not only presisted but even grew more threatening. Ergot was given in teaspoon doses; compression of the uterus and friction

were resorted to, all in vain, and cold water dashed upon the abdomen. When called by Dr. Evers I found the patient with a very feeble pulse, still flowing freely. Ice water injections into the uterus, after removal of the vaginal clots, merely served to cleanse the cavity; the uterus did not respond until swabbed with the iron, which had been prepared while I made ice water injections. The hemorrhage did not return and the patient made a good recovery.

Case III.—Mrs. M., III para, æt. 27, a vigorous, healthy woman, who had already been once delivered two years previous in the maternity, having an easy labor.

When summonod by Dr. Evers, who was in attendance upon the case, I found a uterine fibroid complicating a cross birth and an unusually large fœtus. As soon as the os was sufficiently dilated, I turned and delivered, Dr. Evers following the uterus down with his hand, the bleeding following delivery being more than usual; pressure upon the fundus was kept up and the placenta expelled by Crêdé's method. The hemorrhage not only continued but grew more alarming. Ice was introduced into the uterus, ice was applied to the fundus and ergot given, teaspoon doses every half hour, but ergot, ice and friction only served to lessen the hemorrhage. At times the blood would even flow more freely. We thus tarried for over an hour; the patient was growing more faint, and the hemorrhage must be stopped; the ordinary means had failed and I felt that we should be justified in resorting to the iron, which I dreaded at that time more than I do now. The hand was introduced into the uterus, pressure applied, the clots removed and then with long dressing forceps, through a Cusco speculum, the cavity cleansed with cotton before applying the iron, which had been prepared for some time, to be ready if needed. The hemorrhage at once ceased and the patient made an excellent recovery, leaving the hospital on the 16th day, notwithstanding the version, tumor and hemorrhage.

It may be of interest to add that Dr. Evers has delivered the patient again since, having no difficulty whatsoever, and finding the fibroid somewhat diminished in size.

Case IV.—Lou L., I. para, æt. 17. The hemorrhage was comparatively slight and easily arrested. I merely refer to this case as it was one of post-partum hemorrhage following the use of chloroform and the application of the forceps in the superior

strait in a very tedious painful labor. The iron swab was a once resorted to and the hemorrhage then rapidly checked.

2.—THE VARIOUS REMEDIES GENERALLY RESORTED TO.

Now that I have detailed the treatment which I have myself practiced, I will briefly review the numerous devices and remedies adopted by various writers and earnestly urged by them as the important and often the only means.

OLDER METHODS.

Internal remedies are slow of action and mostly out of place in a system enfeebled by hemorrhage, the stomach acting but slowly, if at all.

Of ergot we have spoken and I would but refer to the heroic doses of acetate of lead given by Dr. Workman, of Canada, (St. Louis MEDICAL AND SURGICAL JOURNAL, April, 1879,); one drachm is dissolved in half a tumbler of water and one-half of this taken; if the uterus does not respond the remainder is taken; uterine contraction is said to follow promptly, more so if the patient vomits. Dr. W. has used this remedy for twenty-five years and claims that it is the safest and surest of all medicinal incitants of post-partum uterine contractions.

Among the less known, and probably questionable remedies is Cannabis Indica, recommended by Dr. Donovan, (*Obstetric Journal* of Grt. Brit. Aug., 1875), who says that a full dose, 20 drops, will check the hemorrhage in a few moments; at least such has been his experience in cases where ergot failed him.

The *external remedies* we must next consider and first among them the mechanical means. (1) The obstetric binder, a time honored institution, well deserves mention as it is still in use, and were it not tolerated, if not advocated, by the best authorities, I should not again refer to it; as I have already stated, if loosely applied it is harmless in ordinary cases, but in cases of hemorrhage it is an obstruction, preventing observation and manipulation of the distending uterus; when pressure is called for, the hand of the obstetrician or of a judicious assistant will do good service, and if hemorrhage has been checked, there is no need of the binder, as the pressure can thus be properly directed, which is impossible with the binder.

(2.) Bimanual compression of the uterus may be resorted to, and it seems reasonable that hemorrhage will be checked by

pressing the anterior and posterior walls of the uterus close together, either as advocated by Dr. Hamilton, of Falkirk, by passing the finger of the right hand high up in the *cul-de-sac* of the vagina, so as to reach the posterior surface of the uterus, while counter pressure is exercised by the left hand through the abdomen; or as advised by Griffith, (*Brit. Obstetric Journal*, Feb., '79,) with one hand in the rectum, then securely grasping the posterior wall of the uterus.

(3.) Compression of the aorta is advocated by the same author, who always resorts to this method and effects the compression either through the abdominal walls or by means of the hand introduced into the uterus, Bradly, (*Brit. Obstetric Journal*-Aug., '78,) says that the uterus after delivery is like an amputated stump, (only partially true,) and therefore the bleeding should be treated in the same way, by compression of the main artery, a remedy which is: 1, always ready; 2, does not prevent the use of other remedies and; 3, is most directly under control.

It is well to bear in mind this expedient, as it may serve a good purpose to check a profuse flow temporarily, until better means are at command; I should not advise that it be relied upon as a final curative treatment.

(4.) Plugging the vagina is an old-time remedy far more dangerous than the binder, tending to convert an external into an internal hemorrhage. It cannot check any but the most harmless and slight flow of blood.

(5.) Elastic pressure from within outward is recommended by some; thus Gurny advocates a Barnes bag introduced into the uterus and distended with cold water; Hyatt, (*Obstetric Journal*, of G. B., Sept., '77, page 383, and *American Journal of Obstetrics*. July, '76,) recommends a rubber balloon or condon distended by air—warm or cold water—and claims that this is the best way to apply cold, saving the wetting and being without danger, besides its mechanical action by pressure; Chassagnez, (*Archives de Tocologie*, May, '76,) and others follow the same plan; while we have other simpler and more reliable methods we do not deem it advisable to resort to this irrational way of applying pressure and distending the uterine cavity; we may thus temporarily check hemorrhage, but we counteract the main object which is to be obtained, i. e., to cause uterine contraction.

(6.) Dr. Wilson, of Baltimore, (Transactions Am. Gyn. Soc.

878,) uses the hand as a curette and with his finger-nails scrapes the placental surface, thus removing any remaining shreds of tissue, contusing the surface and exciting the uterus to action.

We now come to the use of *chemical means*, the local application of stypties and irritants. The historical lemon may be passed over; alum water is a good styptic, so also is vinegar very servicable and has the advantage of being harmless and always at hand—no hovel so poor but vinegar can be supplied.

Dr. Penrose, of Philadelphia, (Transact Am. Gyn. Soc., 1878,) urges the use of vinegar as a convenient, safe and reliable agent to check post-partum hemorrhage due to uterine inertia; it has never failed him in long years of practice. He carries a clean rag saturated with vinegar, with his hand into the cavity of the uterus and squeezes it; he says that the effect of the vinegar flowing over the sides of the uterine cavity and through the vagina is magical; that the muscle instantly responds.

The injection of ice water into the uterus I have frequently resorted to, but I will not urge or again use it myself; even if the uterus responds the chilly effect of the cold is neither pleasant nor beneficial to the patient already lacking the necessary warmth. I shall use hot water instead, and since we are in possession of that invaluable remedy, ice water injections should be entirely discarded.

A somewhat less disagreeable, but also rather less effective method of applying cold is that of some author who exposes his patient and fans the bleeding woman with cool air (the remedy is always convenient, and if time permits might be tried by those fond of experimenting).

The most certain of all applications is the injection of persalts of iron into the uterine cavity; all allow that it is certain in its action, but even its friends and advocates admit that it is a dangerous remedy, it is needless to more than refer to it here, since the subject has been so freely, so fully and ably discussed in England where it is still in high esteem as it needs must be, with Robert Barnes as its champion; moreover we need no longer resort to this final and desperate remedy, since we have one equally certain and perfectly safe in the use of the iron swab.

The danger in the use of the injection of the iron salts is two-fold; the immediate danger of forcing the fluid into the peritoneal cavity or into the open vessels; and the secondary

danger of septicæmia in consequence of the disintegration of clots *in utero*.

The fatal results following the use of these injections both in England and this country have mainly been due to the latter cause.

There is no longer any excuse for resorting to the application of iron in this way.

The interrupted current is a powerful stimulant and may with safety be resorted to if at hand (which it rarely is).

It has served me well in one case where the utmost atony of the uterine fibre existed and the entire labor, every contraction of the muscle, was in response to the electric current, and hemorrhage was avoided by its continuous use. A case is also cited in the *Lancet*, of September 6, 1873, p. 363 in which the patient was saved by galvanism after all means had been tried and even the injection of a dilute solution of iron had failed.

A large bulb shaped electrode should be introduced into the uterus, and the other pole, a flat disc, pressed upon the fundus.

LATER METHODS.

Nitrite of amyl is among the more recent recommendations. It was used by Dr. E. W. Kern, (*Archives of Med.*, Dec., '79, p. 339,) the patient being in a state of collapse, from which she was restored and the hemorrhage immediately and permanently checked. He was led to its use by a paper of Koehler (*Allegem Med. Central Zeitung*, No. 1, 1879,) in which it was recommended that, in case of uterine hemorrhage, warm fomentations be applied to the head to prevent anæmia of the heart and brain, as Dr. K. had by this treatment saved patients in the most dangerous cases of hemorrhage.

The subcutaneous use of ether has been recommended by Macan (*Obst. Jour. of Great Britain*, July, 1876, p. 261,) and by Hecker, of Munich, in the collapse accompanying hemorrhage, but Dr. Chadwick, of Boston, now relies upon this remedy not only to rouse the patient from threatening syncope but to check the hemorrhage, (Transact. Am. Gyn. Soc., 1878, p. —), and since then he tells me that he has used it repeatedly with success, hemorrhage ceasing within five minutes after the injections, and that he now resorts to it as soon as external manipulations and compression of the uterus fail. A half a drachm should be given in two injections, and the dose repeated until the uterus responds. If made deep enough abcesses need not be dreaded.

One of the most recent, convenient, yet safe and reliable remedies, is *The Hot Water Douche*, which has been used freely in the larger hospitals, but has not yet won the confidence of the profession at large, who still look upon it, to a great extent, as a questionable innovation.

The use of the hot water douche as a hæmostatic, although again brought to notice by the authorities of the present day, first of all by Whitwell, of San Francisco, is of older date, (Haussmann, *Berlin Klin*, *Wochenschrift*, No. 45, 1878, p. 668).

Trousseau used hot water injections as early as 1853 to check hemorrhage in a case of carcinoma uteri, and also in a premature labor (*Gazette des Hopitaux*, 1853, No. 33, p. 135). He made use of vaginal injections as hot as they could be borne and with good results. He was led to adopt this treatment by the following reasoning: If you dip one hand in water of 104° F. the other in water of 32° F. and withdraw them after a time, you will find the one dipped in hot water become cold, and the one dipped in cold water become warm.

Cold may arrest hemorrhage if applied for a very short time, and although we favor the condition for hemorrhage momentarily by the use of heat, this soon ceases and the permanent effect is a decidedly beneficial one.

I would here add as a matter of history that intra-uterine injections during the puerperium were made as early as 1850 by Bonnet, and with good effect, the patient improving greatly for a time in response to the injection, although she finally died (*L'Union Medical*, IV., 4, 1850), (Haussman loc. cit.).

Among the more prominent advocates of the hot water treatment were Athill, (*Dublin Jour. Med. Science*, Jan. 78, and *Lancet*, Feb. 1878, where he gives his experience in sixteen cases,) Whitwell, (*Lancet*, June '78,) Valenta, (*Memorabilia* No 4,) and Ruge, (*Berlin Klin. Wochenschrift*, 1877, No. 1,) who, however, claims that it is of advantage only in some cases; but he uses it as a vaginal douche and relies upon the reflex action.

The most telling paper on the subject is by Carl Richter, and is based upon his experience in 112 cases in 103 puerperæ.

(Ueber Ausspuelung der Gebaemutterhoehle mit 40° R. warmem wasser bei Blutungen im Wochenbett, Zeitschrift fuer Geburtshuelfe und Gynækologie II. 2.)

His first two cases demonstrated at once the importance of the remedy. In the first case ice water, ergot injections, intra-

uterine injections of perchloride of iron, 1 to 5 had all failed; finally hot water injection was resorted to and effected a permanent cure; in the second, the hemorrhage which had not yielded to ergotine and ice water injections was successfully treated by hot water.

Richter claims that the hot water acts first, and mainly, by producing an inflammatory swelling, and only secondary by inducing uterine contraction. In proof of this he refers to Cohnheim's late investigations concerning inflammation. Cohnheim ligates the extremity to be inflamed in order to produce his result with certainty and exactness, and dips it for five or six minutes into water of 50° — 54° C. = 40° — 43° R. = 122° — 129° F.; upon removal of the ligature an inflammatory swelling is rapidly developed, the lymphatics fill, and serum transudes into the interstitial connective tissue, thus the blood vessels are compressed by the distension of the intervening tissues (p. 292). A similar effect is produced in fresh wounds.

The temperature *in utero*, even one-half hour after washing, is 0.5° C. or 0.9° F. above normal; the temperature of the puerperal uterus is always 0.4° — 0.6° C., or 0.7° to 1° F. above that of the axilla.

The uterus, which has contracted in consequence of the hot water douche, is smaller and more firm than during the existence of the hemorrhage, but it is not that firmly contracted, solid lump, which we are wont to find. The fundus is high and remains softer; it is more like an elastic rubber ball. Did the hot water act by inducing contraction only, the uterus would be hard, in fact harder than usual, as after its use all show of blood ceases in twelve or fourteen hours, whilst it usually continues at least forty-eight hours.

The compression of the vessels by the œdematous swelling is also proven by placing an ice bag on a uterus contracted by hot water; the bleeding gradually returns as the inflammatory swelling subsides.

Minute directions are given: When the hemorrhage is first noticed manipulate the uterus, first externally then internally; remove clots as far as possible, and the placenta, if still *in utero*. All this can be done while the irrigator (fountain syringe) is being prepared; it is filled with water at 40.5° R., 123.1° F., which comes out at 39.5° — 40° R., 120.9° — 122° F., a temperature at which it is just possible to move a hand, unaccustomed to

heat, about in the water; under 38.5° the promptness and reliability of effect are lost; the addition of one per cent. of carbolic acid suffices for disinfecting purposes, whilst more would be painful, and by absorption, liable to produce a carbolic acid intoxication; a wide, curved, glass nozzle, open in front only, is used by Richter, who inserts it as far as the internal os and then holds it in place; it is passed to the fundus as long as it may be necessary to use the stream for the purpose of washing out clots; a proper bed pan must be used. Timid women will complain of a feeling of burning up, etc., but can be quieted. Rupture of the perineun and other tears do not oblige us to cease the use of the irrigator.

The injection should be continued until the fluid returns clear, but more than from 2000 — 4000 c. c., or from two to four quarts, were never used.

Ergot was always given as an adjuvant, 1. — 3. grammes or 0.5 — 1.0 of ergotine subcutaneously, and in extreme cases tight bandaging of the extremities was resorted to with excellent effect.

The lochia are pale and serum-like for the first twenty-four to thirty-six hours, and then flesh colored, and white at the usual time.

No ill results followed in any of the 112 cases; on the contrary the getting up was good in every one, as they were all discharged on the 10th or 12th day; in twenty-seven cases the first washing out cured.

I am fully in accord with the statement made by this careful observer, but would add that many of his cases must have been very simple ones, as 103 cases of severe post-partum hemorrhage are not likely to occur in one lying-in hospital, under one physician's care, in the space of a year or two. Many of his cases must have been of such a nature that a cold towel or a lump of ice on the abdomen would have at once checked the hemorrhage.

I must, moreover, add that a glass tube is not the proper nozzle to be used. The patients suffer more from the contact with the hot glass than from the hot water. The tube should have one wide opening but should be of a badly conducting substance, hard rubber; but best of all the pliable rubber nozzle, which we now occasionally use.

The hot water injection is safe, prompt and harmless, and even if no better than other methods, is invaluable in country

practice, as it is always at hand and easily applied; even the thermometer may be dispensed with, as the water can be gauged by the hand unused to heat, if it can barely be moved about in it; a good piece of rubber tubing will supply every want; an ordinary syringe nozzle, or the tube itself, will serve at one end, whilst a funnel, or a bottle with the bottom knocked out, will answer as a receiver at the other, or it may be used as a syphon simply.

The hot water douche is a powerful agent in controlling post-partum hemorrhage when originating, as is usually the case, from the placental site, but that it is equally reliable in those cases in which the hemorrhage is due to a laceration of the cervix, is shown in an excellent paper by Dr. Anna L. Broomell (*Phil. Med. Record*, May 3, 1879). She says that for six months the hot water vaginal douche was used in every case after delivery of the placenta, and in that time, notwithstanding predisposition to relaxation of the uterus, only two cases of post-partum hemorrhage occurred, and these from laceration of the cervix; in one the hot water douche stopped a hemorrhage so free as to come seemingly from the circular artery. It also acted most promptly and efficiently in a case of hemorrhage from an inverted uterus.

An equally warm advocate of the hot water douche is that candid observer and able obstetrician, Dr. Albert H. Smith, of Philadelphia. In a paper read before the Philadelphia County Medical Society (*Phila. Med. Times*) he makes the following statements:

1. "A stream of hot water upon the cervix or the rim of the undilated os, will stimulate contraction of the longitudinal and oblique muscular fibres into an expulsory effort, while the circular fibres surrounding the os relax under its influence.

2. "Thrown into the cavity it produces prompt and vigorous condensation of the uterine wall with an immediate closure of the sinuses.

3. "It will check hemorrhage at any point from laceration, caused by the passage of the child, if used at 110° to 115° F."

As necessary conditions for efficient action, he mentions free play of the muscular contractility and direct access of the stream to the bleeding surface.

Dr. A. H. Smith found the douche so successful in controlling hemorrhage, as it failed him only in two of his earlier cases

before he had full confidence in it, that he has now adopted it as a preventive, and for nearly two years past he has resorted habitually to its use, or at least in every case of labor where it was easily practicable, as soon as the placenta was delivered; the hot water douche cleanses, disinfects, prevents hemorrhage; after pains are diminished and lochia are but slightly abundant; he finds it equally effective in laceration of the cervical or vaginal tissues, when styptics and tampons give suffering to the patient and are loathesome to the physician, and are, moreover, often followed by alarming, even fatal, cellulitis.

I have endeavored to distinctly state the claims of the hot water douche as one of our most powerful hæmostatics, and trust it will be given a fair trial.

C.—SYNCOPE.

The syncope which is often encountered in extreme cases, although commanding our earnest attention, must not for a moment be permitted to interfere with our efforts to staunch the flow. The usual remedies may be resorted to, cold air, stimulants, etc., and I will dwell with but a word upon those which are to be resorted to in extreme cases.

The subcutaneous injection of ether, already spoken of as a valuable means in checking hemorrhage, is an excellent remedy and generally within reach; the inhalation of nitrite of amyl will also answer a good purpose, but most reliable is the tight application of roller bandages to the extremities, which serves well in acute anæmia; as Richter, (loc.cit.) who has often resorted to it, says: "The patient improves rapidly, almost with every hour of the bandage; the roller should be removed and reapplied on the upper extremities every eight to twelve hours, on account of the pain it causes; on the lower extremities it may remain several days, but must be removed several times a day, for one-half to one hour at a time; during this period symptoms of anæmia will often return."

Our last resort is transfusion, and this is its proper sphere, acute anæmia, threatened death from loss of blood in a healthy person.

I have myself transfused but twice, once on account of profuse loss of blood during a miscarriage; the patient momentarily rallied after the operation, but did not recover, as sepsis had already set in.

D.—AFTER TREATMENT.

The treatment of puerperal women, after hemorrhage has been checked, is the same as that of any exsanguinated patient, and is, moreover, beyond the scope of this paper. I would only call to mind the importance of disinfection, and vaginal injections, and of washing out the uterine cavity with carbolic acid or permanganate of potash, on the second, third and fourth days, when septic infection threatens from the few clots necessarily remaining *in utero* even after the use of the hot douche, perhaps least of all after a judicious use of the iron swab.

VI.—CONCLUSIONS.

Regardless of the kind of treatment heretofore adopted by myself, I will now, in conclusion, briefly outline that treatment of post-partum hemorrhage, which seems to me the most rational, as suggested by my own experience, and a careful analysis of the recent experience of able and judicious obstetricians.

A.—PREVENTIVE TREATMENT AFTER INDUCTION OF LABOR.

1. Careful attention to every detail, and strict observance of obstetric rules in *every* case of labor.
2. The administration of a full dose of ergot as the head enters the vaginal orifice.
3. Should hemorrhage threaten, follow the uterine fundus with the firmly superimposed hand.
4. Express the placenta by Crêdé's method, and retain a firm grasp upon the fundus.

B.—TREATMENT OF AN EXISTING HEMORRHAGE.

1. External manipulation, pressure, and friction with the cold hand, or with ice.
2. Ergot—best subcutaneously, one or two large doses, whilst other manipulations are in progress.
3. Introduction of the hand into the vagina, and if no contractions follow, into the uterus; removal of clots and irritation of the surface, in order to stimulate contractions.
4. The subcutaneous administration of ether.

4*a*. Ice or vinegar, if at hand, may now be tried in the uterine cavity, but if they fail must not be persisted in.

5. The hot water douche, which, if it is not followed by the desired contraction, will at least stimulate the patient, and cleanse the cavity, so that the final, safest and most reliable remedy may be resorted to.

6. The iron swab—This may be used at once, if the introduction of the hand and the subcutaneous injection of ether fail, or after a trial of the hot water douche; but in desperate cases must be resorted to at once, without losing time with other less reliable methods.